



Name: _____

Date: _____

Period: _____

9C: Angle Sum & Difference Formulas

Practice Exercises

Use a sum or difference identity to find the exact value.

1. $\sin 15$

$$\frac{\sqrt{6} - \sqrt{2}}{4}$$

2. $\cos 75$

$$\frac{\sqrt{6} - \sqrt{2}}{4}$$

3. $\cos \frac{7\pi}{12}$

$$\frac{\sqrt{2} - \sqrt{6}}{4}$$

4. $\tan 15$

(Hint: remember $\tan x = \frac{\sin x}{\cos x}$)

$$2 - \sqrt{3}$$

Write the expression as the sine or cosine of a single angle.

5. $\sin 35 \cos 15 - \cos 35 \sin 15$

$$\sin(35 - 15) = \sin(20)$$

6. $\cos \frac{\pi}{5} \cos \frac{\pi}{10} - \sin \frac{\pi}{5} \sin \frac{\pi}{10}$

$$\cos\left(\frac{\pi}{5} + \frac{\pi}{10}\right) = \cos \frac{3\pi}{10}$$

7. $\sin 3x \cos x + \cos 3x \sin x$

$$\sin(3x + x) = \sin(4x)$$

8. Use a sum identity to verify that $\sin \frac{\pi}{2} = 1$

$$\sin \frac{\pi}{2} = \sin \left(\frac{\pi}{3} + \frac{\pi}{6} \right) = \sin \left(\frac{\pi}{3} \right) \cos \left(\frac{\pi}{6} \right) + \cos \left(\frac{\pi}{3} \right) \sin \left(\frac{\pi}{6} \right) = \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{1}{2} \cdot \frac{1}{2} = \frac{3}{4} + \frac{1}{4} = 1$$

9. Use a difference identity to verify that $\sin \left(\frac{\pi}{2} - u \right) = \cos u$

$$\begin{aligned} \sin \left(\frac{\pi}{2} - u \right) &= \sin \left(\frac{\pi}{2} \right) \cos(u) - \cos \left(\frac{\pi}{2} \right) \sin(u) \\ &= 1 \cdot \cos(u) - 0 \cdot \sin(u) \\ &= \cos(u) \end{aligned}$$